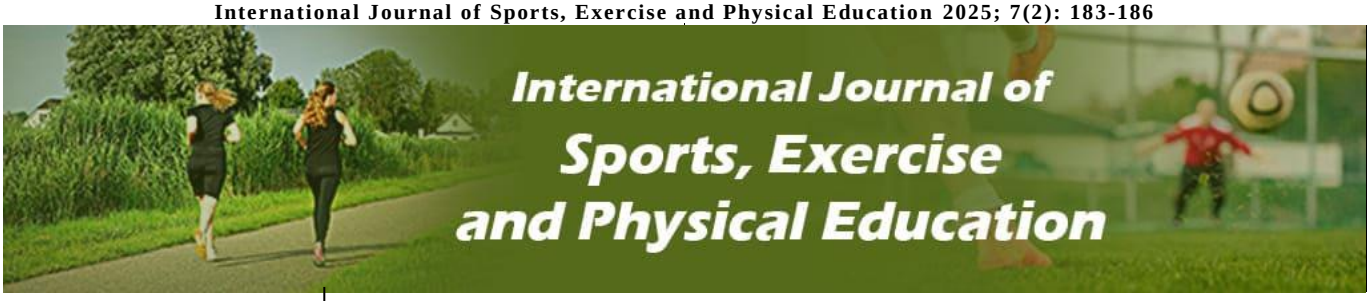

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A descriptive analysis of flexibility performance of the students in residential and non-residential schools in the Kakching District of Manipur

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Abstract
This research paper provides a descriptive analysis of the demographic attributes (age and gender) and flexibility performance, measured using the Sit and Reach Test, of 81 students at Grace Cottage Cultural & Educational Development Foundation, a CBSE-affiliated school in Kakching, Manipur, India that is home to residential (at the time, N=68) and non-residential (at the time, N=13) students. All data were analyzed using JASP software with the aim of calculating central tendency, measures of dispersion, normality tests, and frequency distributions. Results suggested that the sample primarily consisted of students aged 14 and 15 years of age, and was almost evenly distributed in terms of gender. The flexibility performance was described as a mean of 40.52 cm (SD=5.25 cm) for the residential and 38.23 cm (SD=5.43 cm) for the non-residential, both of which were approximately normally-distributed. The descriptive analysis provides baseline information on the differences in flexibility, based on school type, as the information may assist in community-level interventions related to health. Limitations to this study include the small sample of non-residential students, and the lack of inferential statistics.

Keywords: Sit and reach test, flexibility, residential schools, descriptive statistics

Introduction
Physical fitness in young people is important for long-term health, with implications for musculoskeletal development, injury prevention, and general health and well-being [1]. One important component of physical fitness is flexibility, which can be measured by the Sit and Reach Test. The Sit and Reach Test requires participants to sit on the floor with their legs extended straight in front and then reach out as far as they can, with scoring measured in centimeters [2]. Issues with flexibility can vary due to environmental influences, such as the type of school the students attend. The type of school can introduce differences in the daily routine of young people, daily physical activity opportunities, and accessibility to sports facilities, especially in the context of residential vs. non-residential schools [3, 4].
Residential schools, such as the Grace Cottage Cultural & Educational Development Foundation in Kakching, Manipur, offer structured environments that also offer physical education programming within the school day. Each day, residential school students may engage in additional activities that involve exercise, and this may positively affect trended fitness outcomes. In contrast, non-residential schools provide a more variable approach to opportunities for exercise, both through the commuting experience and the opportunities that may or may not exist in the student's home life [5]. These differences in access can create disparities in fitness outcomes between different types of educational programming, however, there remain limited empirical studies that present flexibility performance by school type in young populations (particularly adolescent populations) in smaller regions such as Manipur [6].
The Sit and Reach Test has structured protocols for its use as a measure of flexibility, it also has been validated for use in youth populations and has received empirical support in terms of reliability and appropriateness to define an essential measure of flexibility in youth [7, 8].. The Sit and Reach Test can be influenced by factors such as body dimensions, warm-up protocol before the test, and male-female differences in flexibility performance [9].

Research suggests time-based differences in the flexibility of adolescents using a variety of fitness measures for comparison, but emphasizes the need for localized research within specific educational and cultural contexts [10]. This study seeks to describe the demographic information of the participants (age and gender), as well as the flexibility performance students who attended residential and non-residential school at Grace Cottage in Kakching, Manipur, using descriptive statistics.

The research question is:-
What are the descriptive characteristics (age, gender and Sit and Reach Test scores) of Students attending residential and non-residential schools in Kakching, Manipur?

Objectives of the study

- To analysis the demographic and sit and reach test performance from residential and non-residential students in Kakching district, Manipur.
- To study the limitation of the data for future research work.

2. Materials and Methods

2.1 Participants

Participants were a convenience sample of 81 adolescents who volunteered for this study, and were recruited from Grace Cottage Cultural & Educational Development Foundation, a CBSE-affiliated school in Kakching Makha Leikai, Ward No 11, Kakching District, Manipur, India (795103). Participants were categorized by school type (residential=68; non-residential=13). All participants were aged between 14-16 years of age, with no missing data recorded for any variables. Although it was assumed that relevant ethical considerations (e.g., informed consent, data anonymity) were considered in the data collection process, there were no specific details regarding ethics in the dataset.

2.2 Measures

- **Age:** Categorical (14 years; 15 years; 16 years).
- **Gender:** Binary categorical (Male; Female).
- **Sit and Reach Test:** Continuous measure of flexibility measured per standard protocols (e.g., seated in straight legs with forearm reaching forward). The scores were reported in centimeters, with higher scores indicating greater flexibility.

2.3 Data Analysis

Data were analyzed using JASP version 0.19 (14). Descriptive statistics included: Frequency and percentages for categorical variables (age; gender), medians, means, standard errors of the mean (SE), standard deviations (SD), coefficients of variation (CV), minimums, maximums, and a Shapiro-Wilk test for normality for the continuous variable (Sit and reach test scores), pie charts to visually represent age, gender breakdowns per school type, frequency tables for age and gender, Sit and reach test was not used as frequency data because the number of distinct values was greater than 10. To assist with the group comparisons, the analysis was split by school type. Only descriptive statistics were reported, and no inferential statistics were carried out.

3. Results

3.1 Sample Characteristics: The sample consisted of 68 participants from residential schools and 13 from non-residential schools (there were no missing values for any of the variables).

3.1.1 Age Distributions

Age frequencies are presented in Table 1. Of those in the residential group, 69.11% were 15 years of age, 29.41% were 14 years of age, and 1.47% were 16 years of age. For the non-residential group, 23.07% were 15 years of age, 76.92% were 14 years of age, and none were 16 years of age. The age distributions are also shown as pie charts (Figures 1 and 2). The participants in residential schools were predominately 15 years of age and those in non-residential schools were mainly 14 years of age.

Table 1: Frequencies for age distribution on residential and non-residential group

Type of School	Age (years)	Frequency	Percent	Valid Percent	Cumulative Percent
Residential	15	47	69.118	69.118	69.118
	14	20	29.412	29.412	98.529
	16	1	1.471	1.471	100.000
	Missing	0	0.000	–	–
	Total	68	100.000	–	–
Non-Residential	15	3	23.077	23.077	23.077
	14	10	76.923	76.923	100.000
	16	0	0.000	0.000	100.000
	Missing	0	0.000	–	–
	Total	13	100.000	–	–

Note: Sit and reach test has more than 10 distinct values and is omitted

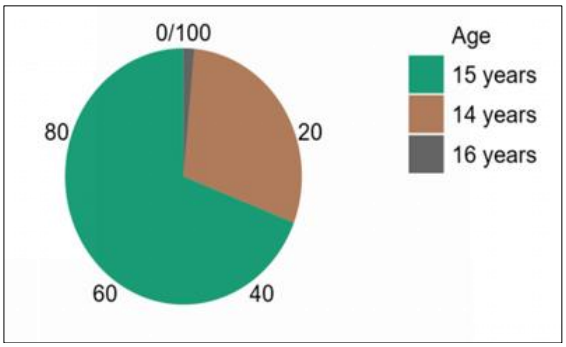

Fig 1: Residential (Age distribution)

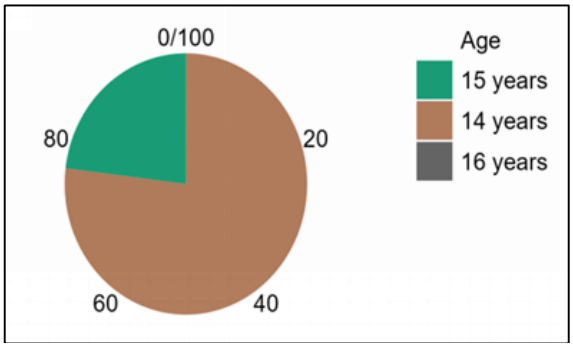

Fig 2: Non-Residential (Age distribution)

3.1.2 Gender Distribution

Table 2 displays the gender frequencies. The residential group was almost even in proportions with 51.47% males and 48.52% females. The non-residential group was 53.84% males and 46.15% females. The pie charts (Figures 3 and 4) show the distributions, showing little gender disparity within groups.

Table 2: Frequencies for gender differences between residential and non-residential group

Type of School	Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Residential	Male	35	51.471	51.471	51.471
	Female	33	48.529	48.529	100.000
	Missing	0	0.000	–	–
	Total	68	100.000	–	–
Non-Residential	Male	7	53.846	53.846	53.846
	Female	6	46.154	46.154	100.000
	Missing	0	0.000	–	–
	Total	13	100.000	–	–

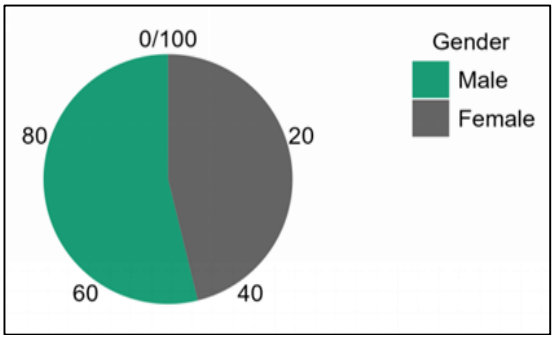

Fig 3: Residential (Gender differences)

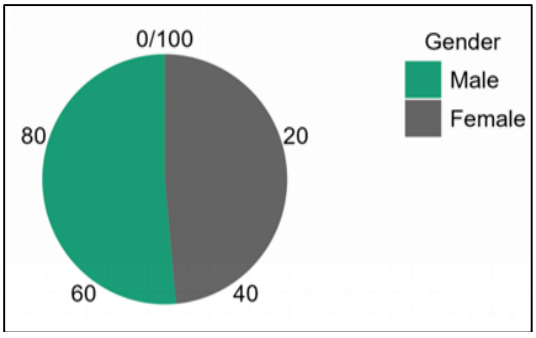

Fig 4: Non-Residential (Gender differences)

3.3 Sit and reach test performance

Table 3 reports the descriptive statistics for Sit and Reach Test scores. Residential students demonstrated a median score of 40.50 cm and a mean score of 40.52 cm (SE=0.64 cm, SD=5.25 cm, CV=0.13) and non-residential students demonstrated a median of 39.00 cm, a mean of 38.23 cm (SE=1.51 cm, SD=5.43 cm, CV=0.14, between subjects scores=29.00 to 51.00 cm for the residential group and 28.00 to 45.00 cm for the non-residential group (A normality test using Shapiro-Wilk test identified no significant deviations (residential: W=0.978, p=0.277; non-residential: W=0.936, p=0.411), suggesting the Sit and Reach Test scores were approximately normally distributed, indicating these findings can be analyzed with parametric methods in future studies.

Table 3: Descriptive statistics for sit and reach test scores by school type

Statistic	Residential	Non-Residential
Valid n	68	13
Missing	0	0
Median	40.500	39.000
Mean	40.515	38.231
Std. Error of Mean	0.637	1.507
Std. Deviation	5.253	5.434
Coefficient of Variation	0.130	0.142
Shapiro-Wilk	0.978	0.936
p-value (Shapiro-Wilk)	0.277	0.411
Minimum	29.000	28.000
Maximum	51.000	45.000

4. Discussion

In summary, this descriptive analysis highlights particular trends within the sample. The age distributions hint that residential schools at Grace Cottage enroll with a higher proportion of 15 year-olds in the residential group (post-16 years) possibly indicating a less considerable bias toward 14 year-old in the non-residential group and group possibility shift due to its. While the gender distributions across the groups offer some assurance of generalizable findings within the immediate context, caution should be advised on the ability to make broad inferences as the non-residential student group was small.

Observationally, while flexibility Test scores indicate modestly higher performance in the residential students (mean ≈ 40.5 cm) versus the non-residential students (mean ≈ 38.2 cm) in total, this is consistent with norms for adolescent males and females as average Sit and Reach scores range from 30-40 cm for the two populations. There was lower variability in the scores of the residential students (CV=0.13) compared with the non-residential (CV=0.14) where the difference may point to less error in physical training environmental consistency. The normality of both groups creates further potential for future comparisons through t-tests or ANOVA.

These findings may reflect the integrated life-style of residential schools that foster consistent activity, though no causation can be determined from descriptive-dependent outcomes. Correspondingly, the findings from this study reinforce identified patterns in homogenous variables of environmental differences influencing adolescent fitness outcomes. Additionally, this study reinforces the relevant usefulness of the Sit and Reach Test for establishing base-line data for a confined area geographical study. Limitations of this study available for the residential (N=68) and the non-residential (N=13) group data sets include the imbalanced n group sizes for variation but also additional covariates such as physical activity, gender, etc. to the high reliability and repeatability within population fidelity of the fixable population; nature of the sports or environmental components, and lack of time or repeated assessments or longitudinal data collection and documentation.

In the hope, youth academics progress with inferential-based statistical approaches for future study's sample demonstrations, sample sizes would expand size including identity versus gender or group, the new array of multivariates analysis and reporting, and school-type influence on fitness were all restricted to descriptive information; and meaningful patterns of differences that the

references for this age or fitness for youth, and alternative educational environmental were limited.

5. Conclusion

This study has described the age, gender, and flexibility profile of residential and non-residential school adolescents at the Grace Cottage Residential School Kakching, to some extent, in supporting subtle differences between the groups and description differences. While providing significant reference points for this study's area for future youth physical health studies including the need for physical targeted fitness programming in residential or non-residential educational system.

6. References

1. Ortega FB, Ruiz JR, Castillo MJ, Sjöström M. Physical fitness in childhood and adolescence: A powerful marker of health. Int J Obes (Lond). 2008 Jan;32(1):1-11. DOI: 10.1038/sj.ijo.0803774.
2. Wells KF, Dillon EK. The sit and reach-a test of back and leg flexibility. Res Q Am Assoc Health Phys Educ Recreat. 1952;23(1):115-8. DOI: 10.1080/10671188.1952.10761965.
3. Sallis JF, Prochaska JJ, Taylor WC. A review of correlates of physical activity of children and adolescents. Med Sci. Sports Exerc. 2000 May;32(5):963-75. DOI: 10.1097/00005768-200005000-00014.
4. Guthold R, Stevens GA, Riley LM, Bull FC. Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1.6 million participants. Lancet Child Adolesc Health. 2020 Jan;4(1):23-35. DOI: 10.1016/S2352-4642(19)30323-2.
5. Strong WB, Malina RM, Blimkie CJ, Daniels SR, Dishman RK, Gutin B, *et al*. Evidence based physical activity for school-age youth. J Pediatr. 2005 Jun;146(6):732-737. DOI: 10.1016/j.jpeds.2005.01.055.
6. Riddoch CJ, Andersen LB, Wedderkopp N, Harro M, Heggebø KL, Sardinha LB, *et al*. Physical activity levels and patterns of 9-and 15-year-old European children. Med Sci Sports Exerc. 2004 Jan;36(1):86-92. DOI: 10.1249/01.MSS.0000106174.43932.92.
7. Miñarro LPA, Andújar PS, García RPL. A comparison of the sit-and-reach test and the back-saver sit-and-reach test in university students. J Sports Sci Med. 2009 Mar 1;8(1):116-22. PMID: 24150564; PMCID: PMC3737781.
8. Romero EV, Artero EG, Pavón JD, García CM, Ortega FB, Piñero CJ, *et al*. Assessing health-related fitness tests in the school setting: Reliability, feasibility and safety; the ALPHA Study. Int J Sports Med. 2010 Jul;31(7):490-7. DOI: 10.1055/s-0030-1251990.
9. Hui SS, Yuen PY. Validity of the modified back-saver sit-and-reach test: A comparison with other protocols. Med Sci Sports Exerc. 2000 Sep;32(9):1655-9. DOI: 10.1097/00005768-200009000-00021.
10. Eberhardt T, Niessner C, Oriwol D, Buchal L, Worth A, Bös K. Secular trends in physical fitness of children and adolescents: A review of large-scale epidemiological studies published after 2006. Int J Environ Res Public Health. 2020 Aug 5;17(16):5671. DOI: 10.3390/ijerph17165671.